IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Shunpei Yamazaki et al.	Art Unit	: 2871
Serial No.	: 10/807,273	Examiner	: Dung T. Nguyen
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Title	: LIQUID CRYSTAL ELECTRO-OPTIC DEVICE		

Mail Stop Appeal Brief - Patents
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BRIEF ON APPEAL

(1) Real Party in Interest

Semiconductor Energy Laboratory Co., Ltd., the assignee of this application, is the real party in interest.

(2) Related Appeals and Interferences

There are no related appeals or interferences.

(3) Status of Claims

Claims 43-102 are pending in the application with claims 43, 47, 51, 55, 59, 64, 69, 74, 79, 83, 87, 91, 95 and 99 being independent. Claims 43-102 have been rejected, and the rejections of all of these claims are appealed.

(4) Status of Amendments

The claims have not been amended subsequent to the final rejection of August 20, 2008.

(5) Summary of Claimed Subject Matter

In the discussion below, reference numerals and references to particular portions of the specification are inserted for illustrative purposes only and are not meant to limit the scope of the claims.

With reference to FIG. 5, independent claim 43 is directed to a liquid crystal display device that includes a first substrate 401 (at the bottom of FIG. 5), a second substrate 401 (at the top of FIG. 5) opposed to the first substrate, a thin film transistor formed (see elements 403-408

and the text at page 27, lines 4-18) over the first substrate, and a liquid crystal layer 413 interposed between the first substrate and the second substrate. Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10. A transparent conductive material is formed over the second substrate. See page 16, lines 13-19.

With reference again to FIG. 5, independent claim 47 is directed to a liquid crystal display device that includes a first substrate 401 (at the bottom of FIG. 5), a second substrate 401 (at the top of FIG. 5) opposed to the first substrate, a thin film transistor formed (see elements 403-408 and the text at page 27, lines 4-18) over the first substrate, and a liquid crystal layer 413 interposed between the first substrate and the second substrate. Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10. A transparent conductive material is formed over an entire surface of the second substrate. See page 16, lines 13-19.

With reference again to FIG. 5, independent claim 51 is directed to a liquid crystal display device that includes a first substrate 401 (at the bottom of FIG. 5), a second substrate 401 (at the top of FIG. 5) opposed to the first substrate, a thin film transistor formed (see elements 403-408 and the text at page 27, lines 4-18) over the first substrate, and a liquid crystal layer 413 interposed between the first substrate and the second substrate. Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10. A transparent conductive material comprising ITO is formed over the second substrate. See page 16, lines 13-19.

With reference again to FIG. 5, independent claim 55 is directed to a liquid crystal display device that includes a first substrate 401 (at the bottom of FIG. 5), a second substrate 401 (at the top of FIG. 5) opposed to the first substrate, a thin film transistor formed (see elements 403-408 and the text at page 27, lines 4-18) over the first substrate, and a liquid crystal layer 413 interposed between the first substrate and the second substrate. Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10. A transparent conductive material comprising ITO is formed over an entire surface of the second substrate. See page 16, lines 13-19.

With reference again to FIG. 5, independent claim 59 is directed to a liquid crystal display device that includes a first substrate 401 (at the bottom of FIG. 5), a second substrate 401 (at the top of FIG. 5) opposed to the first substrate, a thin film transistor formed (see elements 403-408 and the text at page 27, lines 4-18) over the first substrate, and a liquid crystal layer 413 interposed between the first substrate and the second substrate. Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10. A transparent conductive material is formed over the second substrate. See page 16, lines 13-19. A black matrix comprising a resin material is formed adjacent to the second substrate. See page 16, line 20 to page 17, line 4.

With reference again to FIG. 5, independent claim 64 is directed to a liquid crystal display device that includes a first substrate 401 (at the bottom of FIG. 5), a second substrate 401 (at the top of FIG. 5) opposed to the first substrate, a thin film transistor formed (see elements 403-408 and the text at page 27, lines 4-18) over the first substrate, and a liquid crystal layer 413 interposed between the first substrate and the second substrate. Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using

the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10. A transparent conductive material is formed over an entire surface of the second substrate. See page 16, lines 13-19. A black matrix comprising a resin material is formed adjacent to the second substrate. See page 16, line 20 to page 17, line 4.

With reference again to FIG. 5, independent claim 69 is directed to a liquid crystal display device that includes a first substrate 401 (at the bottom of FIG. 5), a second substrate 401 (at the top of FIG. 5) opposed to the first substrate, a thin film transistor formed (see elements 403-408 and the text at page 27, lines 4-18) over the first substrate, and a liquid crystal layer 413 interposed between the first substrate and the second substrate. Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10. A transparent conductive material comprising ITO is formed over the second substrate. See page 16, lines 13-19. A black matrix comprising a resin material is formed adjacent to the second substrate. See page 16, line 20 to page 17, line 4.

With reference again to FIG. 5, independent claim 74 is directed to a liquid crystal display device that includes a first substrate 401 (at the bottom of FIG. 5), a second substrate 401 (at the top of FIG. 5) opposed to the first substrate, a thin film transistor formed (see elements 403-408 and the text at page 27, lines 4-18) over the first substrate, and a liquid crystal layer 413 interposed between the first substrate and the second substrate. Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10. A transparent conductive material comprising ITO is formed over an entire surface of the second substrate. See page 16, lines 13-19. A black matrix comprising a resin material is formed adjacent to the second substrate. See page 16, line 20 to page 17, line 4.

With reference again to FIG. 5, independent claim 79 is directed to a liquid crystal display device that includes a thin film transistor over a substrate 401 (at the bottom of FIG. 5) and including at least a gate electrode 403, a semiconductor film 406 adjacent to the gate electrode, and an electrode 407 or 408 electrically connected to the semiconductor film. See page 27, lines 4-18. The liquid crystal display device also includes a common electrode 404 over the substrate and a liquid crystal layer 413 over the thin film transistor and the common electrode. A transparent conductive material is over the liquid crystal layer, with the liquid crystal layer located between the substrate and the transparent conductive material. See page 16, lines 13-19 (describing a transparent conductive material on a second substrate above the liquid crystal layer). Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10.

With reference again to FIG. 5, independent claim 83 is directed to a liquid crystal display device that includes a thin film transistor over a substrate 401 (at the bottom of FIG. 5) and including at least a gate electrode 403, a semiconductor film 406 adjacent to the gate electrode, and an electrode 407 or 408 electrically connected to the semiconductor film. See page 27, lines 4-18. The liquid crystal display device also includes a common electrode 404 over the substrate and a liquid crystal layer 413 over the thin film transistor and the common electrode. A transparent conductive material comprising ITO is over the liquid crystal layer, with the liquid crystal layer located between the substrate and the transparent conductive material. See page 16, lines 13-19 (describing a transparent conductive material comprising ITO on a second substrate above the liquid crystal layer). Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10.

With reference again to FIG. 5, independent claim 87 is directed to a liquid crystal display device that includes a thin film transistor over a substrate 401 (at the bottom of FIG. 5)

and including at least a gate electrode 403, a semiconductor film 406 over the gate electrode, and an electrode 407 or 408 electrically connected to the semiconductor film. See page 27, lines 4-18. The liquid crystal display device also includes a common electrode 404 over the substrate and a liquid crystal layer 413 over the thin film transistor and the common electrode. A transparent conductive material is over the liquid crystal layer, with the liquid crystal layer located between the substrate and the transparent conductive material. See page 16, lines 13-19 (describing a transparent conductive material on a second substrate above the liquid crystal layer). Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10.

With reference again to FIG. 5, independent claim 91 is directed to a liquid crystal display device that includes a thin film transistor over a substrate 401 (at the bottom of FIG. 5) and including at least a gate electrode 403, a semiconductor film 406 over the gate electrode, and an electrode 407 or 408 electrically connected to the semiconductor film. See page 27, lines 4-18. The liquid crystal display device also includes a common electrode 404 over the substrate and a liquid crystal layer 413 over the thin film transistor and the common electrode. A transparent conductive material comprising ITO is over the liquid crystal layer, with the liquid crystal layer located between the substrate and the transparent conductive material. See page 16, lines 13-19 (describing a transparent conductive material comprising ITO on a second substrate above the liquid crystal layer). Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10.

With reference again to FIG. 5, independent claim 95 is directed to a liquid crystal display device that includes a thin film transistor over a substrate 401 (at the bottom of FIG. 5) and including at least a gate electrode 403, an amorphous semiconductor film 406 adjacent to the gate electrode, and an electrode 407 or 408 electrically connected to the semiconductor film. See

page 27, lines 4-18. The liquid crystal display device also includes a common electrode 404 over the substrate and a liquid crystal layer 413 over the thin film transistor and the common electrode. A transparent conductive material is over the liquid crystal layer, with the liquid crystal layer located between the substrate and the transparent conductive material. See page 16, lines 13-19 (describing a transparent conductive material on a second substrate above the liquid crystal layer). Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10.

With reference again to FIG. 5, independent claim 99 is directed to a liquid crystal display device that includes a thin film transistor over a substrate 401 (at the bottom of FIG. 5) and including at least a gate electrode 403, an amorphous semiconductor film 406 adjacent to the gate electrode, and an electrode 407 or 408 electrically connected to the semiconductor film. See page 27, lines 4-18. The liquid crystal display device also includes a common electrode 404 over the substrate and a liquid crystal layer 413 over the thin film transistor and the common electrode. A transparent conductive material comprising ITO is over the liquid crystal layer, with the liquid crystal layer located between the substrate and the transparent conductive material. See page 16, lines 13-19 (describing a transparent conductive material comprising ITO on a second substrate above the liquid crystal layer). Long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. See page 1, line 20 to page 2, line 3; page 12, lines 8-13; page 12, line 20 to page 13, line 3; and page 19, line 14 to page 20, line 10.

(6) Grounds of Rejection to be Reviewed on Appeal

Claims 43-102 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo (JP-261181) in view of Funada (JP 53-048542).

(7) **Argument**

One of ordinary skill in the art would have had no reason to modify the device of Kondo by adding a transparent conductive layer over the second substrate as allegedly shown by Funada, and Kondo teaches away from such a modification.

As discussed above, independent claim 43 recites a liquid crystal display device that includes a first substrate, a second substrate opposed to the first substrate, a thin film transistor formed over the first substrate, *a transparent conductive material formed over the second substrate*, and a liquid crystal layer interposed between the first substrate and the second substrate. Claim 43 further recites that long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device. As discussed in the specification, the long axes are maintained parallel with a surface of the first substrate by applying a horizontal electric field when driving the liquid crystal display device.

Kondo discloses a liquid crystal display device in which a horizontal electric field that is parallel to the surface of the substrate is applied to a liquid crystal material. See paragraph [0012] of the English translation of Kondo. Kondo is critical of prior devices that applied a vertical electric field that was perpendicular to the surface of the substrate, see paragraph [0003] of the English translation of Kondo, and purported to solve problems associated with such prior devices. See paragraph [0009] of the English translation of Kondo.

Funada's FIG. 5 shows a liquid crystal device in which either a horizontal electric field or a vertical electric field may be applied at different times. Funada's FIG. 6 shows that the long axes of the liquid crystal molecules are perpendicular to the substrate surface when a vertical electric field is applied, and Funada's FIG. 7 shows that the long axes of the liquid crystal molecules are parallel to the substrate surface when a horizontal electric field is applied. (Funada's FIG. 5 also indicates that the long axes of the liquid crystal molecules are perpendicular to the substrate surface when both a horizontal electric field and a vertical electric field are applied.)

Acknowledging that Kondo does not describe a transparent conductive material formed over the second substrate, the rejection relies on Funada as describing such a conductive

material. The rejection further asserts that one would have modified Kondo's device in view of Funada in order to improve display characteristics and obtain a LCD with a fast response as discussed in the English translation of Funada at page 5, line 11. Appellant disagrees.

In the device of Kondo, an electric field is applied parallel with a substrate surface (i.e., a horizontal electric field is applied). By contrast, in the device of Funada, the electrode 4, which is allegedly formed from a transparent conductive material, is used to apply an electric field perpendicularly to a substrate surface (i.e., a vertical electric field). As such, since Kondo operates in a completely different way from Funada, there would have been no reason to incorporate Funada's electrode into Kondo's device.

In addition, as noted at paragraphs [0003] to [0008] of the full translation of Kondo, Kondo severely criticized devices that applied a vertical electric field (i.e., an electric field perpendicular to a substrate surface), and the very purpose of Kondo's device was to employ a horizontal electric field (i.e., an electric field parallel to a substrate surface) to solve the problems associated with vertical electric fields. Thus, Kondo affirmatively teaches away from the modification set forth in the rejection, and one of ordinary skill in the art would have had no reason to make that modification.

The rejection indicates that the modification would have been done in order to improve display characteristics and obtain an LCD with a fast response, and points to page 5, line 11 of the English translation of Funada. However, while that passage notes those benefits, it notes them as being benefits of the device of Funada, not as benefits of using the electrode 4. Thus, in view of these stated benefits, one of ordinary skill, at best, would have been motivated to replace Kondo's device with Funada's, not to modify Kondo's device in the manner set forth in the rejection.

The advisory action responds to arguments similar to those noted above by arguing that Funada discloses a vertical electric field together with a horizontal electric field, and that the modification therefore would have been obvious. While applicant agrees that Funada, in FIGS. 5-7, shows a device in which either a vertical field (as shown in FIG. 6) or a horizontal field (as shown in FIG. 7) may be applied, this in no way would have led to the modification of Kondo's device to include the electrode of Funada. Moreover, if the device of Kondo were modified to include the vertical electric field of Funada, this would have resulted in a situation, as shown in

FIG. 6 of Funada, in which long axes of liquid crystal molecules in the liquid crystal layer would not be kept parallel with a surface of the first substrate when not using the thin film transistor to drive the liquid crystal display device, which would be contrary to the recitation of claim 43.

As acknowledged by the Examiner, Funada does not desccribe a transparent conductive layer.

The rejection indicates Funada's electrode 4 is a transparent conductive layer. However, Funada provides no indication that this is the case. At page 3 of the office action of December 28, 2007, the Examiner acknowledges that Funada does not describe forming the electrode 4 from a transparent conductive material, but argues that such a material would be inherent in Funada's device:

> "the Examiner agrees that Funada et al. do not explicitly disclose a transparent conductive based material for the electrode 4; however, Funada et al. do disclose a Guest-Host type LCD, i.e., kind of a transmissive LCD. Therefore, it is inherent to form a transparent conductive for electrodes in such Funada et al. LCD device."

Applicant disagrees with the Examiner's conclusion. In particular, Funada at, for example, page 5, lines 19-20 of the English translation, notes that Funada's device is a "reflective liquid crystal display." Accordingly, the electrode 4 could have been implemented with a reflective material, and it would not have been inherent to form the electrode 4 from a transparent material.

For at least the reasons presented above, the rejection of claim 43 and its dependent claims should be reversed.

Like claim 43, independent claims 47, 51, 55, 59, 64, 69 and 74 recite a transparent conductive material formed over a second substrate. Similarly, independent claims 79, 83, 87, 91, 95 and 99 recite a transparent conductive material over a liquid crystal layer such that the liquid crystal layer is located between the transparent conductive material and a substrate including a thin film transistor. Accordingly, the rejection of these claims and their dependent claims should also be reversed for the reasons discussed above.

The appeal brief fee in the amount of $540 was paid in advance on February 20, 2009 by way of deposit account authorization. A fee in the amount of $130 for a one-month extension of time is being paid concurrently herewith on the electronic filing system (EFS) by way of deposit

account authorization. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 6/3/09

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Appendix of Claims

1-42. (Canceled)

43. (Previously Presented) A liquid crystal display device comprising:

a first substrate and a second substrate opposed to the first substrate;

a thin film transistor formed over the first substrate; and

a liquid crystal layer interposed between the first substrate and the second substrate,

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device, and

wherein a transparent conductive material is formed over the second substrate.

44. (Original) A liquid crystal display device according to claim 43 wherein the first and the second substrates comprise a glass or a quartz substrate.

45. (Original) A liquid crystal display device according to claim 43 wherein the thin film transistor comprises an amorphous silicon.

46. (Original) A liquid crystal display device according to claim 43 wherein the transparent conductive material functions as an electrode.

47. (Previously Presented) A liquid crystal display device comprising:

a first substrate and a second substrate opposed to the first substrate;

a thin film transistor formed over the first substrate; and

a liquid crystal layer interposed between the first substrate and the second substrate,

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device, and

wherein a transparent conductive material is formed over an entire surface of the second substrate.

48. (Original) A liquid crystal display device according to claim 47 wherein the first and the second substrates comprise a glass or a quartz substrate.

49. (Original) A liquid crystal display device according to claim 47 wherein the thin film transistor comprises an amorphous silicon.

50. (Original) A liquid crystal display device according to claim 47 wherein the transparent conductive material functions as an electrode.

51. (Previously Presented) A liquid crystal display device comprising:

a first substrate and a second substrate opposed to the first substrate;

a thin film transistor formed over the first substrate; and

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device, and

wherein a transparent conductive material comprising ITO is formed over the second substrate.

52. (Original) A liquid crystal display device according to claim 51 wherein the first and the second substrates comprise a glass or a quartz substrate.

53. (Original) A liquid crystal display device according to claim 51 wherein the thin film transistor comprises an amorphous silicon.

54. (Original) A liquid crystal display device according to claim 51 wherein the transparent conductive material functions as an electrode.

55. (Previously Presented) A liquid crystal display device comprising:

a first substrate and a second substrate opposed to the first substrate;

a thin film transistor formed over the first substrate; and

a liquid crystal layer interposed between the first substrate and the second substrate,

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the

thin film transistor and when not using the thin film transistor to drive the liquid crystal display device, and

wherein a transparent conductive material comprising ITO is formed over an entire surface of the second substrate.

56. (Original) A liquid crystal display device according to claim 55 wherein the first and the second substrates comprise a glass or a quartz substrate.

57. (Original) A liquid crystal display device according to claim 55 wherein the thin film transistor comprises an amorphous silicon.

58. (Original) A liquid crystal display device according to claim 55 wherein the transparent conductive material functions as an electrode.

59. (Previously Presented) A liquid crystal display device comprising:

a first substrate and a second substrate opposed to the first substrate;

a thin film transistor formed over the first substrate; and

a liquid crystal layer interposed between the first substrate and the second substrate,

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device,

wherein a transparent conductive material is formed over the second substrate, and

wherein a black matrix comprising a resin material is formed adjacent to the second substrate.

60. (Previously Presented) A liquid crystal display device according to claim 59 wherein the first and the second substrates comprise a glass or a quartz substrate.

61. (Previously Presented) A liquid crystal display device according to claim 59 wherein the thin film transistor comprises an amorphous silicon.

62. (Previously Presented) A liquid crystal display device according to claim 59 wherein the transparent conductive material functions as an electrode.

63. (Previously Presented) A liquid crystal display device according to claim 59 wherein the black matrix contains a black pigment.

64. (Previously Presented) A liquid crystal display device comprising:

a first substrate and a second substrate opposed to the first substrate;

a thin film transistor formed over the first substrate; and

a liquid crystal layer interposed between the first substrate and the second substrate,

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the

thin film transistor and when not using the thin film transistor to drive the liquid crystal display device,

wherein a transparent conductive material is formed over an entire surface of the second substrate, and

wherein a black matrix comprising a resin material is formed adjacent to the second substrate.

65. (Previously Presented) A liquid crystal display device according to claim 64 wherein the first and the second substrates comprise a glass or a quartz substrate.

66. (Previously Presented) A liquid crystal display device according to claim 64 wherein the thin film transistor comprises an amorphous silicon.

67. (Previously Presented) A liquid crystal display device according to claim 64 wherein the transparent conductive material functions as an electrode.

68. (Previously Presented) A liquid crystal display device according to claim 64 wherein the black matrix contains a black pigment.

69. (Previously Presented) A liquid crystal display device comprising:

a first substrate and a second substrate opposed to the first substrate;

a thin film transistor formed over the first substrate; and

a liquid crystal layer interposed between the first substrate and the second substrate,

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device,

wherein a transparent conductive material comprising ITO is formed over the second substrate, and

wherein a black matrix comprising a resin material is formed adjacent to the second substrate.

70. (Previously Presented) A liquid crystal display device according to claim 69 wherein the first and the second substrates comprise a glass or a quartz substrate.

71. (Previously Presented) A liquid crystal display device according to claim 69 wherein the thin film transistor comprises an amorphous silicon.

72. (Previously Presented) A liquid crystal display device according to claim 69 wherein the transparent conductive material functions as an electrode.

73. (Previously Presented) A liquid crystal display device according to claim 69 wherein the black matrix contains a black pigment.

74. (Previously Presented) A liquid crystal display device comprising:

a first substrate and a second substrate opposed to the first substrate;

a thin film transistor formed over the first substrate; and

a liquid crystal layer interposed between the first substrate and the second substrate,

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the first substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device,

wherein a transparent conductive material comprising ITO is formed over an entire surface of the second substrate, and

wherein a black matrix comprising a resin material is formed adjacent to the second substrate.

75. (Previously Presented) A liquid crystal display device according to claim 74 wherein the first and the second substrates comprise a glass or a quartz substrate.

76. (Previously Presented) A liquid crystal display device according to claim 74 wherein the thin film transistor comprises an amorphous silicon.

77. (Previously Presented) A liquid crystal display device according to claim 74 wherein the transparent conductive material functions as an electrode.

78. (Previously Presented) A liquid crystal display device according to claim 74 wherein the black matrix contains a black pigment.

79. (Previously Presented) A liquid crystal display device comprising:

a thin film transistor over a substrate, wherein the thin film transistor includes at least a gate electrode, a semiconductor film adjacent to the gate electrode, and an electrode electrically connected to the semiconductor film;

a common electrode over the substrate;

a liquid crystal layer over the thin film transistor and the common electrode; and

a transparent conductive material over the liquid crystal layer, wherein the liquid crystal layer is located between the substrate and the transparent conductive material, and

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device.

80. (Previously Presented) A liquid crystal display device according to claim 79 wherein the substrate comprises a glass or a quartz substrate.

81. (Previously Presented) A liquid crystal display device according to claim 79 wherein the transparent conductive material functions as an electrode.

82. (Previously Presented) A liquid crystal display device according to claim 79 wherein the gate electrode and the common electrode are formed on a same surface.

83. (Previously Presented) A liquid crystal display device comprising:

a thin film transistor over a substrate, wherein the thin film transistor includes at least a gate electrode, a semiconductor film adjacent to the gate electrode, and an electrode electrically connected to the semiconductor film;

a common electrode over the substrate;

a liquid crystal layer over the thin film transistor and the common electrode; and

a transparent conductive material comprising ITO over the liquid crystal layer, wherein the liquid crystal layer is located between the substrate and the transparent conductive material, and

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device.

84. (Previously Presented) A liquid crystal display device according to claim 83 wherein the substrate comprises a glass or a quartz substrate.

85. (Previously Presented) A liquid crystal display device according to claim 83 wherein the transparent conductive material functions as an electrode.

86. (Previously Presented) A liquid crystal display device according to claim 83 wherein the gate electrode and the common electrode are formed on a same surface.

87. (Previously Presented) A liquid crystal display device comprising:

a thin film transistor over a substrate, wherein the thin film transistor includes at least a gate electrode, a semiconductor film over the gate electrode, and an electrode electrically connected to the semiconductor film;

a common electrode over the substrate;

a liquid crystal layer over the thin film transistor and the common electrode; and

a transparent conductive material over the liquid crystal layer, wherein the liquid crystal layer is located between the substrate and the transparent conductive material, and

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device.

88. (Previously Presented) A liquid crystal display device according to claim 87 wherein the substrate comprises a glass or a quartz substrate.

89. (Previously Presented) A liquid crystal display device according to claim 87 wherein the transparent conductive material functions as an electrode.

90. (Previously Presented) A liquid crystal display device according to claim 87 wherein the gate electrode and the common electrode are formed on a same surface.

91. (Previously Presented) A liquid crystal display device comprising:

a thin film transistor over a substrate, wherein the thin film transistor includes at least a gate electrode, a semiconductor film over the gate electrode, and an electrode electrically connected to the semiconductor film;

a common electrode over the substrate;

a liquid crystal layer over the thin film transistor and the common electrode; and

a transparent conductive material comprising ITO over the liquid crystal layer, wherein the liquid crystal layer is located between the substrate and the transparent conductive material, and

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device.

92. (Previously Presented) A liquid crystal display device according to claim 91 wherein the substrate comprises a glass or a quartz substrate.

93. (Previously Presented) A liquid crystal display device according to claim 91 wherein the transparent conductive material functions as an electrode.

94. (Previously Presented) A liquid crystal display device according to claim 91 wherein the gate electrode and the common electrode are formed on a same surface.

95. (Previously Presented) A liquid crystal display device comprising:

a thin film transistor over a substrate, wherein the thin film transistor includes at least a gate electrode, an amorphous semiconductor film adjacent to the gate electrode, and an electrode electrically connected to the amorphous semiconductor film;

a common electrode over the substrate;

a liquid crystal layer over the thin film transistor and the common electrode; and

a transparent conductive material over the liquid crystal layer, wherein the liquid crystal layer is located between the substrate and the transparent conductive material, and

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device.

96. (Previously Presented) A liquid crystal display device according to claim 95 wherein the substrate comprises a glass or a quartz substrate.

97. (Previously Presented) A liquid crystal display device according to claim 95 wherein the transparent conductive material functions as an electrode.

98. (Previously Presented) A liquid crystal display device according to claim 95 wherein the gate electrode and the common electrode are formed on a same surface.

99. (Previously Presented) A liquid crystal display device comprising:

a thin film transistor over a substrate, wherein the thin film transistor includes at least a gate electrode, an amorphous semiconductor film adjacent to the gate electrode, and an electrode electrically connected to the amorphous semiconductor film;

a common electrode over the substrate;

a liquid crystal layer over the thin film transistor and the common electrode; and

a transparent conductive material comprising ITO over the liquid crystal layer, wherein the liquid crystal layer is located between the substrate and the transparent conductive material, and

wherein long axes of liquid crystal molecules in the liquid crystal layer are kept parallel with a surface of the substrate both when driving the liquid crystal display device using the thin film transistor and when not using the thin film transistor to drive the liquid crystal display device.

100. (Previously Presented) A liquid crystal display device according to claim 99 wherein the substrate comprises a glass or a quartz substrate.

101. (Previously Presented) A liquid crystal display device according to claim 99 wherein the transparent conductive material functions as an electrode.

102. (Previously Presented) A liquid crystal display device according to claim 99 wherein the gate electrode and the common electrode are formed on a same surface.

Evidence Appendix

NONE

Related Proceedings Appendix

NONE